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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,210	04/17/2006	Kiminori Mizuuchi	2006_0572A	8732

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WENDEROTH, LIND & PONACK L.L.P.
2033 K. STREET, NW
SUITE 800
WASHINGTON, DC 20006

EXAMINER	
PAN, MICHAEL	

ART UNIT	PAPER NUMBER
2828	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,210	MIZUUCHI, KIMINORI	
	Examiner	Art Unit	
	Michael Pan	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/17/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Acknowledgement

This office action is in response to the application filed on April 17, 2006.

Currently, claims 21-40 are pending, claims 1-20 are canceled.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation as claimed in claim 32 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 21-24, 26 and 29-35 are rejected under 35 U.S.C. 102(b) as being anticipated by US 2002/0009102 A1 (Hayakawa et al.).

As for claim 21, Hayakawa et al. (e.g. Fig. 14) shows a coherent light source, comprising: a light source (100); a wavelength conversion element (15) that converts part of a fundamental wave emitted from the light source into a higher harmonic wave ([0143]); and a wavelength selecting filter (91/21) that has narrow-band transmission characteristics with respect to the part of the fundamental wave not converted into the higher harmonic wave ([0005] and [0152]), and has transmission characteristics with respect to the higher harmonic wave (Fig. 14, 19), wherein the part of the fundamental wave emitted from the wavelength conversion element but not converted into the higher harmonic wave is fed back to the light source by the wavelength selecting filter ([0143] and [0186]), and the higher harmonic wave is emitted to the outside after passing through the wavelength selecting filter ([0186]).

As for claim 22, Hayakawa et al. shows the wavelength selecting filter has a band pass filter (Fig. 14, 91) and a dichroic mirror (Fig. 14, 21), the band pass filter has narrow-band transmission characteristics with respect to the part of the fundamental wave not converted into the higher harmonic wave ([0005] and [0152]), and has transmission characteristics with respect to the higher harmonic wave (See Fig. 14, 19), the dichroic mirror reflects the part of the fundamental wave transmitted by the band pass filter but not converted into the higher harmonic wave, and the higher harmonic wave passes through the band pass filter and then passes through the dichroic mirror and is emitted to the outside (Fig. 22, [0186]).

As for claim 23, Hayakawa et al. shows the wavelength selecting filter is a confocal optical system, and the dichroic mirror is installed in the focal plane of the confocal optical system (See Fig. 14).

As for claim 24, Hayakawa et al. shows the light source is a single-mode semiconductor laser ([0137]).

As for claim 26, Hayakawa et al. shows the semiconductor laser has undergone high-frequency superposition ([0131]).

As for claim 29, Hayakawa et al. shows the selected wavelength width of the wavelength selecting filter is 0.2 nm or less ([0062]).

As for claim 30, Hayakawa et al. shows the wavelength conversion element is furnished with a periodic polarization inversion structure ([0117]).

As for claim 31, Hayakawa et al. shows at least one of the end faces of the wavelength conversion element (Fig. 14, 21) is inclined at an angle of 3.degree. or more with respect to the optical axis of the wavelength conversion element (See Fig. 14).

As for claim 32, Hayakawa et al. shows a focusing optical system between the light source and the wavelength conversion element (See Fig 14, 12/13), wherein the focusing optical system has chromatic aberration, and focuses the higher harmonic wave and the part of the fundamental wave not converted to the higher harmonic wave at different focal points. (Note: It is inherent that the focusing optical system has chromatic aberration, and focuses the higher harmonic wave and the part of the fundamental wave not converted to the higher harmonic wave at different focal points.)

As for claim 33, Hayakawa et al. shows the wavelength conversion element including an optical waveguide (Fig. 14, 18).

As for claim 34, Hayakawa et al. shows the wavelength conversion element is directly coupled to the light source (See Fig. 13).

As for claim 35, Hayakawa et al. shows the wavelength selecting filter is installed on an end face or in the interior of the optical waveguide (Fig. 14, 91).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the**

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0009102 A1 (Hayakawa et al.) as applied to claim 21 above.

As for claim 25, Hayakawa et al. disclosed the claimed invention except for the cavity length of the semiconductor laser is 1mm or more. It would have been obvious to one of ordinary skill in the art, at the time the invention was made to form the cavity

length of the semiconductor laser at 1mm or more, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCP 1980).

As for claim 28, Hayakawa et al. disclosed the claimed invention except for the transmittance of the higher harmonic wave of the wavelength selecting filter is 80% or more. It would have been obvious to one of ordinary skill in the art, at the time the invention was made to set the transmittance of the higher harmonic wave of the wavelength selecting filter at 80% or more, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCP 1980).

3. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0009102 A1 (Hayakawa et al) as applied to claim 21 above, in view of US 6763042 (Williams et al.)

As for claim 27, the primary reference fails to show that the light source is a fiber laser.

In the same field of endeavor, Williams et al. teaches the light source is a fiber laser (Fig. 1, 10).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to include the fiber laser light source as taught by Williams, with

Hayakawa's device for the benefit of providing an excellent source of infrared energy for coupling in external conversion cavities.

4. Claims 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0009102 A1 (Hayakawa et al) as applied to claim 21 above, in view of US 2004/0120647 A1 (Sakata et al.)

As for claim 36, the primary reference shows the wavelength conversion element including an optical waveguide (Fig. 14, 18), the wavelength selecting filter has a band pass filter installed on an end face or in the interior of the optical waveguide (Fig. 14, 91), the band pass filter has narrow-band transmission characteristics with respect to the part of the fundamental wave not converted into the higher harmonic wave ([0005] and [0152]), and has transmission characteristics with respect to the higher harmonic wave (Se Fig. 14, 19), the dichroic mirror reflects the part of the fundamental wave transmitted by the band pass filter but not converted into the higher harmonic wave, and the higher harmonic wave passes through the band pass filter and then passes through the dichroic mirror and is emitted to the outside ([0186]).

However, the primary reference fails to show a dichroic mirror installed on an end face of the optical waveguide,

In the same field of endeavor, Sakata et al. teaches a dichroic mirror installed on an end face of the optical waveguide ([0008]).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to include the dichroic mirror as taught by Sakata, with Hayakawas device for the benefit of reducing the size.

As for claim 37, the combination of Hayakawa et al. and sakata et al. disclosed the claimed invention except for the thickness of the dichroic mirror being 1 mm or more. It would have been obvious to one of ordinary skill in the art, at the time the invention was made to form the thickness of the dichroic mirror to 1 mm or more, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCP 1980).

5. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0009102 A1 (Hayakawa et al) as applied to claim 21 above, in view of US 2004/0027648 A1 (Furukawa et al.).

As for claim 38, the primary reference fails to show an optical device, having an image conversion optical system, wherein the light from the coherent light source is converted into a two-dimensional image by the optical system.

In the same field of endeavor, Furukawa et al. teaches an optical device, having an image conversion optical system, wherein the light from the coherent light source is converted into a two-dimensional image by the optical system ([0124]).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to include the optical device as shown by Hayakawa with Furukawa's image forming apparatus for the benefit of forming an image apparatus.

As for claim 39, Furukawa et al. teaches that the conversion optical system comprises a two-dimensional beam scanning optical system (See Fig. 21 and [0124]).

6. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable US 2002/0009102 A1 (Hayakawa et al) in view of US 2004/0027648 A1 (Furukawa et al.) as applied to claim 38 above, and further in view of US 6845113 B2 (Kitaoka et al.).

Regarding claim 40, the previous combination fails to show the image conversion optical system comprises a two-dimensional switch.

In the same field of endeavor, Kitaoka et al. teaches that the image conversion optical system comprises a two-dimensional switch (Fig. 12, 49 and Col. 1, lines 43-45).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to include the two-dimensional switch as taught by Kitaoka, in the apparatus of the previous combination for the benefit of providing separate switching.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pan whose telephone number is (571) 270-

1867. The examiner can normally be reached on Monday-Friday 7:30 AM - 5:00 PM Eastern Standard Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MP
11/29/2007

MINSUN OH HARVEY
PRIMARY EXAMINER